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PREPARATION OF SURFACE USE PLANS: A USER'S GUIDE

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PREPARATION OF SURFACE USE PLANS: A USER'S GUIDE

Introduction

This brochure was prepared by the Wyoming Bureau of Land Management to provide oil and gas lessees, operators and consultants with detailed information regarding preparation of Surface Use Plans. USGS approval of operations (NTL-6) lists data necessary for preparation of an Application for Permit to Drill (APD). However, there has been some confusion regarding the engineering data needed by BLM for timely review of the surface use and operations plan.

The following information and example drawings illustrate a hypothetical site and access road in rugged terrain. Engineering design, slope staking and carefully controlled construction are all necessary in this case. Under less severe conditions, some requirements may not be necessary. Operators and consultants should contact the Chief, Division of Operations, or Chief, Branch of Surface Protection, in the appropriate BLM District Office for guidance relating to specific cases.

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Multi-Point Surface Use and Operations Plan

1. Existing Roads

a. *Location of proposed well in relation to town or other reference point.* This may be a map or narrative. (Example: The proposed well is located 7 miles west of LaBarge, Wyoming.)

b. *Proposed route to the location.* Narrative and map. (Example: Access to the proposed site is via U.S. Highway 100 to the Deep Creek Road, then west on the Deep Creek Road approximately 9.1 miles, then north approximately 1.6 miles along a proposed access road to be constructed.)

c. *Location and description of all roads in the area.* Map with narrative explanation. The Deep Creek Road is a 20 ft. wide asphalt surface road maintained by the County. The Hogsback Ridge Road is an existing oil and gas access road; 16 ft. width and unsurfaced maintained by ABC Oil Company. All other roads in the vicinity are unimproved "two track trails."

d. *Plans for improvement and/or maintenance of existing roads.* Narrative explanation. (Example: No improvement or maintenance of the Deep Creek Road is planned. Approximately 1.6 miles of access road will be constructed as described in Section 2 below.)

2. Planned Access Roads

In general, preliminary engineering plans (of the type shown in Figure A) are necessary for access roads proposed under the following conditions:

- —Profile grade greater than 10%
- —Side (cross) slopes greater than 25%.
- —Cuts or fills over 10 feet in height.
- —Terrain showing evidence of past landslides, sloughing, or severe erosion activity.

When detailed plans are not required, the following minimum information should be submitted:

- —Roadway width.
- —Maximum grade (percent grade and length of grade).
- —Proposed turnouts (include typical drawing and location).
- —Location (by centerline station) and size of all culverts.
- —Other pertinent drainage design information including plans for erosion control, culvert outlet protection, etc.
- —Surface material (if any).

NTL-6 requires centerline staking for all roads. Slope staking is generally needed on all roads proposed under the conditions described above. Slope staking may be required on other roads if it is determined to be needed for construction control. This determination will be made by the BLM District's Chief, Division of Operations.

The roadway centerline location should be planned so that it will serve all needs should the well become a "producer." Substantial justification will be required to alter access road locations once they have been approved and constructed.

3. Location of Existing Wells

NTL-6 is self-explanatory on this. The information may be shown on the same map submitted for Section 1 or on a separate map of suitable scale.

4. Location of Tank Batteries, Production, Facilities, etc.

NTL-6 is self-explanatory. See Section 3 above.

5. Location and Type of Water Supply

Narrative and/or map showing location of water source. Include narrative explanation of method for transporting water. If additional water haul roads or pipelines are needed, include information in accordance with Section 1 and 2 above. Operator must meet USGS requirements if a separate water well is proposed.

6. Source of Construction Material

Narrative description of location or adequate map should be submitted. If surfacing material is required, obtain suitable material within the proposed road construction area or from established pits. Proposed haul roads are subject to requirements of Sections 1 and 2 above. An estimate (in cubic yards) of the amount of material needed should be included.

7. Methods for Handling Waste Disposal

Include complete explanation of the methods, locations and specifications to be utilized in containment and disposal of all types of waste as described in NTL-6, Section III, A-7. Reference may be made to plans, diagrams and narratives included in Section 9 and 10 below. The explanation should be as specific as possible at the time of its preparation.

8. Ancillary Facilities

If significant earthwork is required for construction of these proposed facilities, plans of the type shown in Figures A and B should be submitted. As a minimum, layout drawings of camps, airstrips, etc., should be included along with their planned location in relationship to the proposed well site.

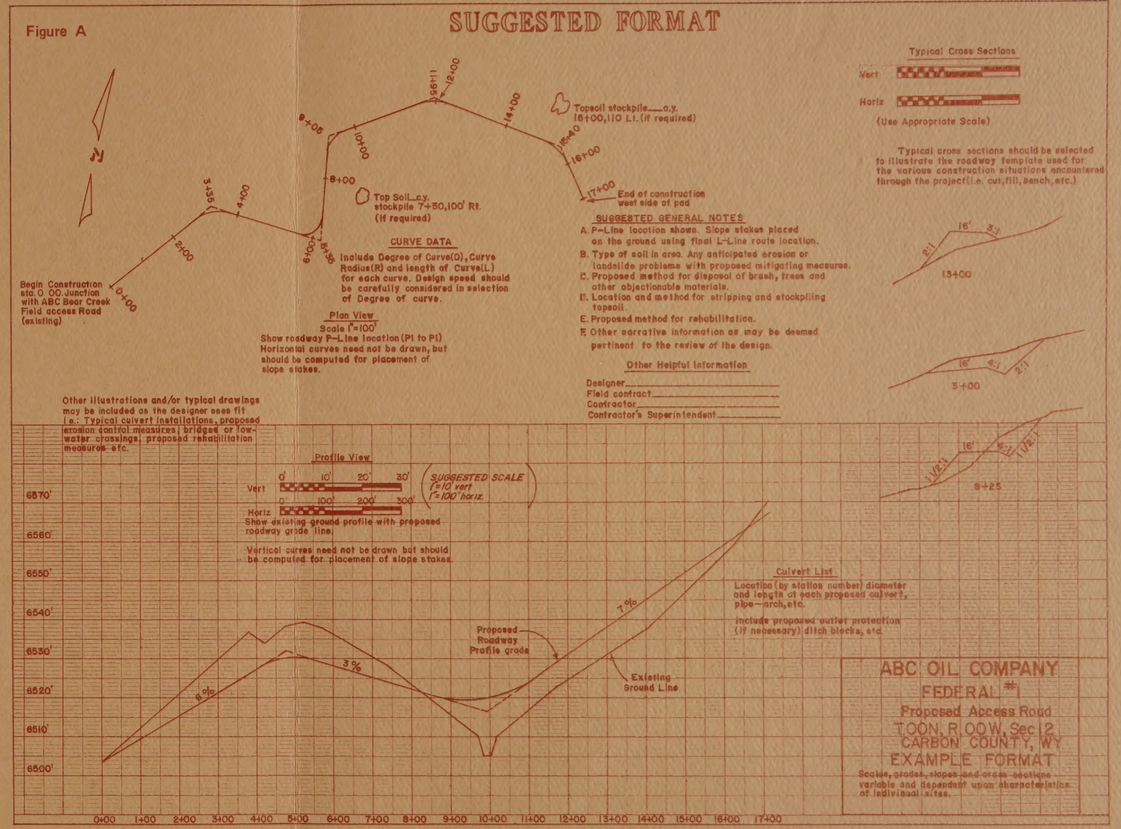
9. Well Site Layout

An engineering plan in general conformance with Figure B should be prepared to show all proposed earthwork at the well site. Typical cross-sections of pad and reserve pit should be included and topsoil and waste cut material stockpiles should be shown. In addition, a plat showing proposed locations for mud tanks, burn and trash pits or cages, pipe racks, turnaround and parking areas, living facilities and orientation of the rig with respect to pad and facilities should be submitted. Minimum scale for this plat shall be 1 inch = 50 feet.

Plans, if any, for lining the reserve pit should be submitted. These should include type of lining material, rates of application, etc.

Prior to beginning construction at all proposed well sites, cut and fill slope stakes must be placed for the pad and reserve pits in accordance with Section III, A-9 of NTL-6.

Figure A


SUGGESTED FORMAT
Typical Cross Sections
Vert
Horiz
(Use Appropriate Scale)
Typical cross sections should be selected to illustrate the roadway template used for the various construction situations encountered through the project(i.e. cut, fill, bench, etc.)
Begin Construction sta. 0+00 Junction with ABC Bear Creek Field access Road (existing)
Top Soil c.y. stockpile 7+50, 100' Rt. (if required)
Topsoil stockpile c.y. 16+00, 110 Lt. (if required)
End of construction west side of pad
CURVE DATA
Include Degree of Curve(D), Curve Radius(R) and length of Curve(L) for each curve. Design speed should be carefully considered in selection of Degree of curve.
Plan View
Scale 1"=100'
Show roadway P-Line location (PI to PI) Horizontal curves need not be drawn, but should be computed for placement of slope stakes.
SUGGESTED GENERAL NOTES
A. P-Line location shown. Slope staken placed on the ground using final L-Line route location.
B. Type of soil in area. Any anticipated erosion or landslide problems with proposed mitigating measures.
C. Proposed method for disposal of brush, trees and other objectionable materials.
D. Location and method for stripping and stockpiling topsoil.
E. Proposed method for rehabilitation.
F. Other narrative information as may be deemed pertinent to the review of the design.
Other Helpful Information
Designer
Field contract
Contractor
Contractor's Superintendent
Other illustrations and/or typical drawings may be included as the designer sees fit. i.e.: Typical culvert installations, proposed erosion control measures, bridges or low-water crossings, proposed rehabilitation measures etc.
Profile View
Vert
Horiz
SUGGESTED SCALE 1"=10' vert 1"=100' horiz.
Show existing ground profile with proposed roadway grade line.
Vertical curves need not be drawn but should be computed for placement of slope stakes.
Proposed Roadway Profile grade
Existing Ground Line
6% 3% 7%
Culvert List
Location (by station number) diameter and length of each proposed culvert, pipe—arch, etc.
Include proposed outlet protection (if necessary) ditch blocks, etc.
ABC OIL COMPANY
FEDERAL #1
Proposed Access Road
T00N, R00W, Sec 12
CARBON COUNTY, WY
EXAMPLE FORMAT
Scales, grades, slopes and cross sections variable and dependent upon characteristics of individual sites.

10. Plans for Restoration of the Surface

This section must be considered concurrently with Sections 1, 2 and 9 since restoration is an integral part of the total design package. A complete, comprehensive explanation of the overall restoration plan for all surface disturbance should be submitted in narrative and diagrammatic format. The plan should include, but not be limited to, the following information:

- —Overall program and timetable for restoration and rehabilitation (include best estimate for start and completion dates of each phase of restoration process, i.e., road, pad, pit, etc.)
- —Proposed layout and contours of the restored topography.
- —Plan for restored drainage system including proposed short and long-term erosion control measures.
- —Handling and segregation of spoil materials.
- —Methods and equipment to accomplish the surface restoration.
- —Complete and detailed waste disposal plan.
- —Proposed methods for soil treatment and revegetation.

11. Other Information

In addition to general information outlined in Section III, A-11 or NTL-6, specific information relative to construction methods and practices needed to accommodate potential geologic hazards, presence of streams, ponds, archeological or cultural sites, etc., and other pertinent information should be submitted.

References may be made to other sections where this information has been previously provided. Sections III, A-12 & 13 of NTL-6 are self-explanatory.

Figure B

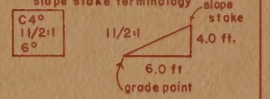
SUGGESTED FORMAT

ABC OIL COMPANY
FEDERAL #1

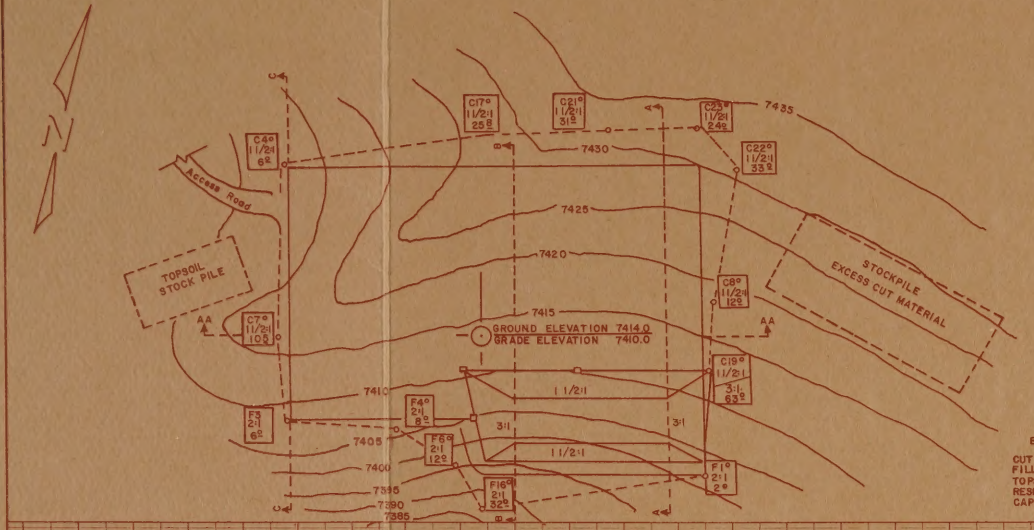
T.00 N, R.00 W, Sec 6
UINTA COUNTY, WYOMING

KEY

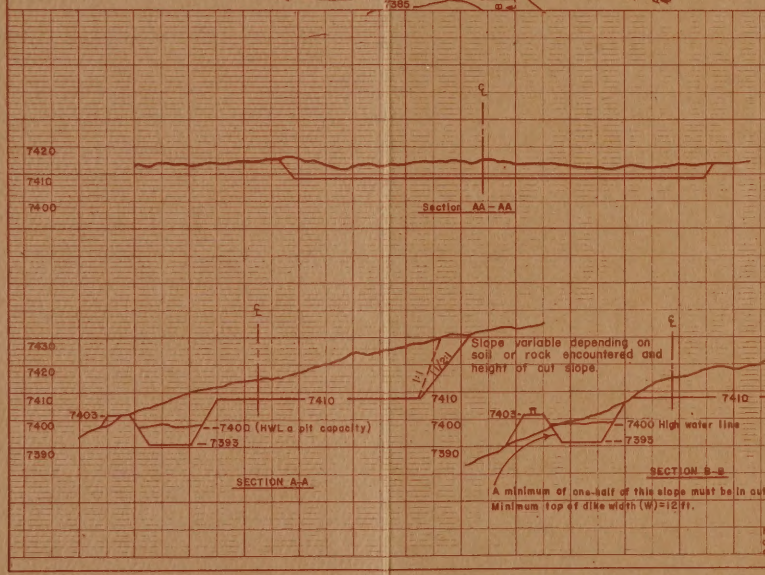
minimum scale 1"= 50'
——Limits of construction
o slope stake
⊙ proposed hole location
□ pit slope stakes
(placed after pad area is leveled)
slope stake terminology



Scales, grades, slopes and cross-sections variable and dependent upon characteristics of individual sites.



EARTHWORK
CUT _____ cu yds.
FILL _____ cu yds.
TOPSOIL _____ cu yds.
RESERVE PIT CAPACITY _____ barrels



NOTES Suggested Procedure

1. Engineering Field examine to determine how to locate and skew platform to best fit terrain and minimize excavation and embankment.
2. Preliminary survey to obtain ground elevations.
3. Draftsman, Plots survey and prepare topographic maps
4. Engineer, Reviews plot, Recommends any deviation i.e. raise or lower grade, Designs reserve pit.
5. Approximate earthwork quantities are determined, cut and fill and slope staking.
6. Final slope staking prior to construction.

Other helpful information
1. Design Engineer _____
2. Field Inspector _____
3. Contractor _____
4. Contractor's Superintendent _____

CUT SLOPES
Dirt 1:1 Max over 20' May be necessary to terrace, flatten slope, etc in slide prone areas
Rock 1/2:1 Max (fractured)
1/4:1 Max (solid)

FILL SLOPES
Pad 1 1/2:1 Max
Pit 2:1 Max

NOTE: Above slopes are maximum values. It is desirable to use less severe slopes whenever site conditions permit.

Computation of Reserve Pit Capacity

$$Vol.(cu.ft.)=\frac{D}{6}[AB+cb+(A+c)(B+b)]$$

$$\frac{V(cu.ft.)}{43560}=V(Acre-Ft)$$

1 Ac.ft = 7780 Barrels (Approx.)

Example: A=200' B=70' c=140' b=40' side slope=1 1/2:1 end slope=3:1 D=10'

$$V=\frac{D}{6}[AB+cb+(A+c)(B+b)]$$

$$V=\frac{D}{6}[(200\times70)+(140\times40)+(200+140)(70+40)]$$

$$V=\frac{10}{6}[(14,000)+(5600)+(37,400)]$$

$$V=\frac{10}{6}[57,000]=95,000\,Ft.^3=2.18\,Ac.Ft$$
$$=16,917\ barrels$$

When computing pit capacity allow for adequate freeboard (top of the dike elevation minus high water line elevation)

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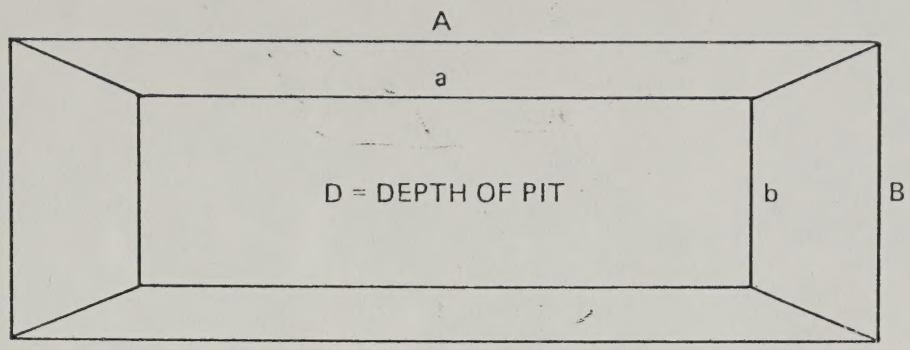
COMPUTATION OF RESERVE PIT CAPACITY



VOLUME EQUIVALENTS:

1 ACRE FEET = 43560 CUBIC FEET
1613 CUBIC YARDS
7760 BARRELS

CALCULATIONS:

$$\text{VOLUME (CU. FT.)} = \frac{D}{6}\left[AB+ab+(A+a)(B+b)\right]$$

$$\text{VOLUME (AC. FT.)} = \frac{D\left[AB+ab+(A+a)(B+b)\right]}{261360}$$

$$\text{VOL. (BARRELS)} = \frac{D\left[AB+ab+(A+a)(B+b)\right]}{33.7}$$

EXAMPLE:

A = 200′ B = 70′ D = 10′ SIDE SLOPE 1½:1
a = 140′ b = 40′ END SLOPE 3:1

$$\text{VOLUME (CU. FT.)} = \frac{10}{6}\left[200\cdot70 + 140\cdot40 + 340\cdot110\right] = 95000 \text{ FT.}^3$$

$$\text{VOLUME (AC. FT.)} = \frac{10\left[200\cdot70 + 140\cdot40 + 340\cdot110\right]}{261360} = 2.18 \text{ AC. FT.}$$

$$\text{VOL. (BARRELS)} = \frac{10\left[200\cdot70 + 140\cdot40 + 340\cdot110\right]}{33.7} = 16914 \text{ BARRELS}$$

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